SANTA CRUZ ISLAND RUFOUS-CROWNED SPARROW (*Aimophila ruficeps obscura*)

Paul W. Collins, Santa Barbara Museum of Natural History, 2559 Puesta Del Sol, Santa Barbara, CA 93105; pcollins@sbnature2.org

Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
5	0	7.5	10	10	0	5

Special Concern Priority

Currently considered a Bird Species of Special Concern (year-round), Priority 3. This subspecies was not included on the original Prioritized list (Remsen 1978), or on CDFG's (1992) unprioritized list.

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment at the subspecies level (Sauer et al. 2000). The species has also been overlooked during the point count monitoring surveys conducted by the National Park Service (NPS) during the breeding season on East Anacapa island (Fancy 2000).

General Range and Abundance

The Santa Cruz island rufous-crowned sparrow is endemic to California, residing only on Santa Cruz and Anacapa islands (Grinnell and Miller 1944, AOU 1957, Collins 1999). It is an uncommon to common breeding resident on these two islands and may have formerly inhabited Santa Catalina (Jones and Collins in press).

Seasonal Status in California

Occurs year round; breeding season extends from late March to late August (Jones and Collins in press).

Historical Range and Abundance in California

Grinnell and Miller (944) describe the Santa Cruz island rufous-crowned sparrow as a "permanent resident" of the Upper Sonoran life-zone on Santa Rosa, Santa Cruz, Anacapa and Santa Catalina

islands. They list it as "common" at least on Santa Cruz island. The occurrence of this species on Santa Rosa and Santa Catalina islands has been questioned. Miller (1951) suggested that the rufous-crowned sparrow observed on 2 April 1927 at Santa Rosa island (Pemberton 1928) was probably misidentified. The fact that this species has not been observed again on Santa Rosa island, despite intensive surveys for it (Miller 1951, Rett 1953, Collins unpubl. data) would tend to support Miller's contention that this species does not occur on this island. Two specimens assigned to *A. r. obscura* (Dickey and Van Rossem 1923) were apparently collected at Santa Catalina island I on 19 & 28 June 1863 by J. G. Cooper (Cooper 1870, MVZ 4140 & 4141). There have been no further observations of this species on Santa Catalina island since 1863 (Jones and Collins in press). Whether or not these specimens indicate the occurrence of a breeding population on Santa Catalina more that a century ago is impossible to verify; however the dates when they were collected and the fact that this is a sedentary species suggests that they could have been resident and have since been extirpated (Jones and Collins in press). Since none have been reported since 1863, and since Cooper (1870) lists a number of very unusual bird records (first and only Channel Island sightings) from Santa Catalina, it is probably safer to conclude that there may have been some mistake in regard to the collection locality for the 1863 specimens.

Santa Cruz Island. No quantitative estimates of historic abundance exist. Most of the early reports regarding the status of rufous-crowned sparrows on Santa Cruz island list the species as "fairly common" or "common" (Linton 1908, Howell and Van Rossem 1911, Willett 1912, 1933; Howell 1917, Dickey and Van Rossem 1923, Sheldon 1928). In the spring of 1915, Dawson (1923) recorded it as "abundant" on Santa Cruz island.

Anacapa Island. Rufous-crowned sparrows were first reported from Anacapa island on 26 August 1940 (LACM #19783) and were not observed again until 1963 (Banks 1966). It is likely that this species was overlooked by ornithologists who visited Anacapa prior to 1940, although Johnson (1972) suggests that it colonized Anacapa in recent times. The secretive habits and

predilection for inaccessible, brush-covered slopes make this species difficult to observe. It is easy to see given these habits why this species may have been overlooked by ornithologists who visited Anacapa prior to 1940.

Recent Range and Abundance in California

Except for the possible extirpation of a breeding population of rufous-crowned sparrows on Santa Catalina island, the outline of the breeding range today remains largely unchanged. Vegetation stripping from overgrazing by feral herbivores during the past 150 years undoubtedly caused a reduction in suitable coastal sage/grassland breeding habitat for rufous-crowned sparrows on the islands. As a result, one island population (Santa Catalina) may have been extirpated and both of the other populations were reduced in overall numbers. However, since feral herbivores have been removed from Anacapa and Santa Cruz islands, suitable breeding habitat for this species is more broadly distributed across these two islands today and rufous-crowned sparrow numbers appear to be on the rise.

Santa Cruz Island. Miller (1951) found rufous-crowned sparrows to be "somewhat more dense" on Santa Cruz island than were populations of this species along the southern California coast but provides no quantitative data to support this statement. By the 1980s, this species was recorded as "widespread" (P. Unitt unpubl. data) and "fairly common" (M.A. Holmgren unpubl. data), and by the early 1990s it was reported as "extremely common" (M.A. Holmgren unpubl. data). Today rufous-crowned sparrows are a "local, but generally fairly common to common breeding resident " on Santa Cruz island in coastal sage scrub that is located on moderate to steep xeric s-facing slopes (Jones and Collins in press).

Anacapa Island. There is no quantitative data regarding the distribution and abundance of rufous-crowned sparrows on Anacapa island. In 1963-1964, it was one of the "more common passerine species" encountered (Banks 1966); by 1968 it was "common on "Middle and West" Anacapa (J. Diamond unpubl. data); and by the mid-1970s it was a "fairly common resident" (L.

Jones unpubl. data). Today it is restricted to West and Middle Anacapa for breeding and is occasionally seen on East Anacapa (Jones and Collins in press). Landbird population monitoring conducted by the National Park Service (NPS) on East Anacapa since 1993 has only recorded rufous-crowned sparrows during one fall survey (Fancy 2000). The fact that this species has been overlooked by the NPS monitoring efforts on East Anacapa is undoubtedly due to the fact that the transects for this survey are on flat terrace areas and not on the steeper slopes that this species is known to prefer.

Ecological Requirements

The ecological requirements of the Santa Cruz island rufous-crowned sparrow are largely undescribed. On Santa Cruz island, its preferred habitat has been described as "grassy hill slopes and canyon walls where there are scattered bushes or clumps of cactus" (Grinnell and Miller 1944:497), thick patches of prickly pear (*Opuntia* sp) cactus (Dawson 1923), and *Artemisia-Opuntia*-grass associations (Miller 1951). Birds apparently shift habitat slightly during the winter (Wolf 1977).

Throughout its range in California, rufous-crowned sparrows are normally found on moderate to steep, dry, rocky, south- or west-facing slopes vegetated with a low cover of scattered shrubs interspersed with patches of grasses, forbs and bare ground (Collins 1999). They show a marked preference for coastal sage scrub dominated by California sagebrush (*Artemisia californica*), but are also reported in coastal bluff scrub, low chaparral on serpintine outcrops, sparse chaparral recovering from a burn, and edges of tall chaparral (Collins 1999). Dominant overstory plants associated with habitats used by *A. ruficeps* include California sagebrush, purple sage (*Salvia leucophylla*), black sage (*S. mellifera*), California encelia (*Encelia californica*), coyote brush (*Baccharis pilularis*), mock heather (*Ericameria ericoides*), deer weed (*Lotus scoparius*), giant rye (*Leymus condensatus*), and buckwheat (*Eriogonum* sp.) (Collins 1999). This species prefers moderate west-, south-, and east-facing slopes vegetated with low, fairly open cover of shrubs and

grass (Collins 1999). Rufous-crowned sparrows tend to prefer younger stands of shrub with a more open aspect to shrub cover, and avoid dense, continuous stands of single shrub or tree species (Shuford 1993, Collins 1999). Since this unique combination of vegetative and physiographic features preferred by rufous-crowned sparrows tend to occur in disjunct patterns, the distribution of breeding populations of this species also occur in what appear to be clumped, local colonies (Cogswell 1968, Collins 1999).

On the islands, it appears that *A. r. obscura* inhabits similar types of open scrub-grassland habitats on moderate south- and west-facing slopes as has been reported for populations of *A. ruficeps* on the mainland (P. Collins unpubl. data). Santa Cruz island rufous-crowned sparrows inhabit coastal-bluff, coastal-sage scrub, and open coyote-brush scrub. Dominant shrubs associated with *A. r. obscura* habitat on Anacapa and Santa Cruz islands include California sagebrush, California encelia, coyote brush, giant rye, buckwheat, prickly pear cactus (*Opuntia* sp.), coastal cholla (*O. prolifera*), black sage, and lemonaid berry (*Rhus integrifolia*). There is no data regarding the habitat characteristics of where Santa Cruz island rufous-crowned sparrows place their nests. They probably select settings similar to those used by *A. ruficeps* on the mainland. Nests are generally situated in grass or against shrubs or grass tussocks either on the ground, flush with the ground, in a natural depression or hole in the ground, or infrequently up to 45 cm off the ground in a low bush (reviewed in Collins 1999). Pairs will raise two and possibly three broods, and will re-nest following nest failure (Collins 1999). The fall diet of rufous-crowned sparrows in California is comprised of 88.4% vegetable and 11.6% animal matter, with the latter generally taken in higher proportion during the breeding season (Barlow 1902, Collins 1999). Rufous-crowned sparrows forage primarily on the ground generally under the protective cover of vegetation and only rarely in open areas, in foliage, or on branches of taller woody vegetation (reviewed in Collins 1999).

There are no studies available regarding the factors that limit Santa Cruz island rufous-crowned sparrow populations. Degradation of grasslands, coastal bluff, coastal sage scrub, and low

growing chaparral habitats on both Santa Cruz and Anacapa islands from more than 150 years of intensive grazing by feral herbivores has certainly limited the amount of suitable breeding habitat available for *A. r. obscura*. Moderate to heavy grazing by feral sheep (*Ovis aries*) on Santa Cruz island has been shown to "alter plant community structure through, depletion of the herbaceous layer, defoliation of the lower branches of shrubs, and reduction of shrub density" (Van Vuren and Coblentz 1987:264). Overgrazing by feral sheep has also been shown to result in arborescence of chaparral shrubs, and has led to a substantial reduction in distribution of the coastal sage scrub habitat on Santa Cruz island (Brumbaugh 1980). The dominant plants of coastal sage scrub and coastal bluff are low-growing shrubs and herbaceous plants, that are vulnerable to complete defoliation by sheep (Minnich 1980). Changes to the structure of native scrub and grassland habitats on Santa Cruz island were shown to result in a dramatic decline in *A. r. obscura* density. Van Vuren and Coblentz (1987) recorded 83 birds/km^2 in a lightly grazed chaparral-grassland community but found no birds in a similar habitat that was moderately grazed. Nest predation by ground-based mammalian and reptilian predators was a primary factor responsible for nest failure of *A. ruficeps* nests in coastal sage scrub in southern California (Ellison 1998). This may be one of the principal factors controlling *A. r. obscura* populations on Santa Cruz island where Santa Cruz island scrub-jay (*Aphelocoma insularis*), Santa Curz island fox (*Urocyon littoralis santacruzae*), channel island spotted skunk (*Spilogale gracilis amphialus*) and feral pigs (*Sus scrofa*) abound. Predation from feral cats (*Felis catus*) at West Anacapa island (historically) and black rats (*Rattus rattus*) on all three of the Anacapas (currently) have probably limited *A. r. obscura* populations on Anacapa island. Thus, nest predation from native and introduced predators, coupled with degredation of preferred scrub-grassland breeding habitat by past feral herbivore grazing and current feral pig rooting are the primary factors that may be limiting *A. r. obscura* populations.

Threats

Loss, fragmentation, and degradation of rufous-crowned sparrow habitats from disturbance by feral mammals (black rats, feral pigs) and long-term fire suppression are currently the primary threats to the Santa Cruz island rufous-crowned sparrow. The rufous-crowned sparrows' preference for areas of short brush suggests they are "short-distance colonizers, adapted to invade areas swept by fire or other disturbances that open up the cover" (Shuford 1993:373). Controlling or eliminating episodic factors such as fire or light to moderate levels of grazing will, over the long-term, lead to the development of dense, decadent stands of chaparral and coastal sage scrub on Anacapa and Santa Cruz islands. Rufous-crowed sparrows are expected to abandon chaparral and coastal sage scrub once the brush cover becomes too dense (Collins 1999). This in turn could result in further fragmentation of suitable coastal sage scrub-grassland habitats and will ultimately affect the relative abundance of *A. r. obscura* populations. Rufous-crowned sparrows on the mainland are more abundant in larger patches of suitable coastal scrub habitat than in smaller, more fragmented patches (Bolger et al. 1997). Reproductive failure resulting from increased levels of nest predation on Anacapa island by black rats and on Santa Cruz island by feral pigs, island fox, spotted skunk, and island scrub-jay is probably a threat to the insular populations of this subspecies. Alteration of native habitats from feral herbivore grazing (historically on both islands) and from feral pig rooting (presently only on Santa Cruz island) have increased the susceptibility of ground nesters like the rufous-crowned sparrow to predation from both native (island fox, spotted skunk and island scrub-jay) and nonnative (feral cat, black rat, and feral pig) nest predators. Brown-headed cowbird (*Molothrus ater*) parasitism is not currently a factor affecting *A. r. obscura* populations. This is because cowbirds are not known to breed on any of the Channel Islands (Jones and Collins in press), and *A. ruficeps* is only a rare host of cowbirds on the mainland (Ellison 1998, see review in Collins 1999).

Management and Research Recommendations

- Conduct research to identify specific habitat requirements and ecological conditions that will support self-sustaining populations; in particular determine demographic rates in various habitat types, such as coastal bluff, coastal sage scrub and open chaparral.
- Initiate studies to examine how fire can be used in chaparral and coastal sage scrub habitats on the islands to help maintain suitable open scrub/grassland habitats for the Santa Cruz island rufous-crowned sparrow.
- Implement the restoration programs proposed by the NPS to eradicate black rats on Anacapa island (NPS 2000) and feral pigs on Santa Cruz island (NPS 2001).
- Initiate field studies designed to gather basic descriptive attributes (e.g. phenology, breeding biology, ecology, population demography (life tables), behavior, and behavioral ecology) that can be used to fill in data gaps that exist in nearly all aspects of the life history of the Santa Cruz island rufous-crowned sparrow.
- Gather data on the distribution and relative abundance of *A. r. obscura* on both Anacapa and Santa Cruz islands to determine how widely distributed the subspecies is on each island and to begin to characterize the vegetative and physiographic parameters that identify good *A. r. obscura* habitat.
- Develop and implement a more intensive species-specific monitoring program designed to better detect possible population declines in *A.. r. obscura*. Such a monitoring program would generate data that could be used to promote a better understanding of the population dynamics of this subspecies.
- Implement a genetic study using single-locus micro-satellite DNA analysis to elucidate the genetics, phylogeny, and taxonomic validity of the Santa Cruz island rufous-crowned sparrow.

Such a study could also be useful in determining the population genetic structure of this island endemic.

Monitoring Needs

Current NPS landbird monitoring efforts (van Riper et al. 1988, Sogge et al. 1989, Super et al. In press, Fancy 2000), and USFWS breeding Bird Surveys (BBS) are inadequate for monitoring changes in the population dynamics of this subspecies. Survey routes are typically along roads or trails on relatively flat to only slightly sloped terrain, and/or only on islands where marginal habitat exists for the species (East Anacapa). Most Santa Cruz island rufous-crowned sparrows occur on moderate to steep brush covered slopes away from roads and existing trails. Off-road VCP counts might be a more suitable method for monitoring populations of *A. r. obscura* (Ralph et al. 1993). Establishing a Christmas Bird Count (CBC) route on Santa Cruz island may be inadequate for monitoring changes in the distribution and abundance of *A. r. obscura* populations during the winter. This is due principally to the species cryptic appearance, stealthy behavior, predilection for inaccessible arid, rocky and brushy habitat, and to the fact that they are generally quiet during fall and winter months (see review in Collins 1999). All of these factors combine making it difficult to adequately census this species outside of the breeding season. Annual monitoring should include estimation of an index of breeding population size using standardized off-trail VCP counts. Attempting to estimate annual adult survival and breeding productivity via constant-effort mist-netting or the MAPS program may not be feasible with this species. Mist-netting in the types of scrub habitats that this species prefers is very difficult and the high winds and variable weather conditions on the islands are a problem when it comes to mist netting.

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